## CLAIMS

1. Semiconductor laser comprising an active waveguide (3) extending in the longitudinal (X), lateral (Y) and vertical (Z) directions, comprising an active region (4), surrounded by a filler material (5) and coupled to a distributed reflector (7, 8), characterized in that said distributed reflector (7, 8) is implemented in said filler material (9) along at least one of the lateral sides of the active region (4) and essentially parallel to them, in the form of at least a first configuration (7, 8) with a photonic band gap along said longitudinal axis (X).

2. Laser as claimed in claim 1, characterized in that said first configuration (7, 8) extends over one portion at least of the extension (h) of the active region (4) in the vertical direction (Z), and over one portion at least of the extension (h) of the filler material (5) in the vertical direction (Z).

3. Laser as claimed in one of claims 1 or 2, characterized in that said first configuration (7, 8) is a first photonic crystal formed by localized etching of the filler material (5) in such a manner as to form hollow columns (9) there or to leave columns of material remaining there, these columns comprising a periodic grating of diffracting elements with a lattice in the horizontal plane, which lattice has dimensions of roughly the wavelength of laser operation.

4. Laser as claimed in claim 3, characterized in that said columns (9) extend essentially parallel to said vertical direction (Z) of the active region (4).

5. Laser as claimed in one of claims 3 or 4, characterized in that said lattice of the grating of the first photonic crystal has the shape of a convex polygon,

6. Laser as claimed in claim 5, characterized in that said polygon is a regular polygon.

7. Laser as claimed in one of claims 1 to 6, characterized in that said first configuration (7, 8) is spaced away from the lateral sides of the active region by an essentially constant distance (d).

8. Laser as claimed in one of claims 1 to 6, characterized in that said first configuration (7, 8) is spaced away from the lateral sides of the active region by a distance (d1, d2) which varies along the extension (L) of said active region (4) in the longitudinal direction (X).

9. Laser as claimed in one of claims 1 to 8, characterized in that said active waveguide comprises, on at least one of the longitudinal ends of the active region (4), a filler material (5) in which, at a distance $\delta L$ from the first configuration (7, 8), reflection means (10) are formed which are implemented in the form of a second photonic band gap configuration and extending essentially parallel to the extension (l) of the active region (4) in the lateral direction (Y).

10. Laser as claimed in claim 9, characterized in that said second configuration (10) extends at least over the entire extension (h) of the active region (4) in the vertical direction (Z).

11. Laser as claimed in one of claims 9 or 10, characterized in that said second configuration (10) extends over the entire extension (l) of the active region (4) in the lateral direction (Y), and over one portion at least of the extension of the filler material (5) in the lateral direction (Y).

12. Laser as claimed in one of claims 9 to 11, characterized in that said second configuration (10) is a second photonic crystal formed by localized etching of the filler material (5) in such a manner as to form hollow columns (13) there or to leave columns of material remaining there, these columns comprising a periodic grating of diffracting elements with a lattice in the horizontal plane, which lattice has dimensions of roughly the wavelength of laser operation.

13. Laser as claimed in claim 12, characterized in that said columns (13) extend essentially parallel to said vertical direction (Z) of the active region (4).

14. Laser as claimed in one of claims 12 or 13, characterized in that said lattice of the grating of the second first photonic crystal has the shape of a convex polygon.

15. Laser as claimed in claim 14, characterized in that said polygon is a regular polygon.

16. Laser as claimed in one of claims 9 to 15, characterized in that said distance $\delta L$ is essentially equal to a whole number times half the wavelength of laser operation in the filler material such that the first and second configurations (7, 8; 10) define a Fabry-Perot type resonant cavity.